

WHAT IS CLAIMED IS:

1. A method of enhancing the nutrient value of distillers, brewers or fermenters grain byproducts, comprising:
  - adding predetermined nutrient sources into the wet end of distillation or fermentation byproducts after at least one of fermentation and/or distillation to create a distillation and/or fermentation by-product-nutrient source mixture; and
  - changing at least one of the bypass protein (RUP/UIP) level, amino acid levels in the RUP/UIP and the post ruminal digestibility of the by-product nutrient source mixture to predetermined levels by changing the temperature of the by-product-nutrient source mixture.
2. The method of claim 1, wherein temperature of the by-product mixture ranges from about 180°F to about 250°F.
3. The method of claim 2, wherein the temperature of the by-product mixture is about 218°F.
4. The method of claim 1, wherein at least two of the bypass protein (RUP/UIP) level, amino acid levels in the RUP/UIP and the post ruminal digestibility of the by-product nutrient source mixture are changed to predetermined levels by changing the temperature of the by-product-nutrient source mixture.
5. The method of claim 1, wherein the bypass protein (RUP/UIP) level, amino acid levels in the RUP/UIP and the post ruminal digestibility of the by-product nutrient source mixture are changed to predetermined levels by changing the temperature of the by-product-nutrient source mixture.
6. A method of producing an improved distillers, brewers or fermenters grain by-product, comprising:
  - establishing desirable nutritional values, including RUP/UIP levels and/or RUP/UIP amino acid levels for a nutritionally enhanced distillers, brewers or fermenters grain by-product;
  - determining nutrients and nutrient amounts to be added to the by-product to achieve one or more nutritionally enhanced distillers, brewers or fermenters grain by-products that have at least one of lower RUP/UIP and different RUP/UIP amino acid levels, than the established desirable values thereof;
  - mixing determined amounts of nutrients with wet distillers, brewers or fermenters grain; and

heating the mixture of wet distillers grains and nutrients to achieve a by-product temperature between from about 180°F to about 250°F to change at least one of the bypass protein (RUP/UIP) level, amino acid levels in the RUP/UIP and the post ruminal digestibility of the mixture to achieve the established desirable nutritional values.

7. The method of claim 6, wherein the predetermined nutrient amounts are mixed with wet distillers, brewers or fermenters grain in an off-line mixer.

8. The method of claim 6, wherein the predetermined nutrient amounts are premixed prior to being mixed with the wet distillers, brewers or fermenters grain.

9. The method of claim 6, wherein the premixed nutrient amounts are added to the wet distillers, brewers or fermenters grain prior to drying.

10. The method of claim 6, wherein the predetermined nutrient amounts are added to the wet distillers, brewers or fermenters grains both before being dried and while being dried.

11. The method of claim 6, further comprising cooling the mixture to reach a temperature below about 200°F.

12. The method of claim 6, further including extruding in the process.

13. The method of claim 12, further including applying heat to the mixture while extruding the mixture.

14. The method of claim 6, wherein at least two of the bypass protein (RUP/UIP) level, amino acid levels in the RUP/UIP and the post ruminal digestibility of the mixture are changed.

14. The method of claim 6, wherein all three of the bypass protein (RUP/UIP) level, amino acid levels in the RUP/UIP and the post ruminal digestibility of the mixture are changed.

15. The method of claim 6, wherein desirable nutritional values are established for crude protein, total amino acids, fat fiber, minerals, a ruminant animal bypass protein(RUP/UIP) range, amino acids in the RUP/UIP and post ruminal digestibility of the RUP/UIP

16. A system for enhancing the nutrient value of distillers, brewers or fermenters grain byproducts, comprising:

an injector to inject predetermined nutrient sources into the wet end of distillers, brewers or fermenters grain distillation or fermentation byproduct creating

process after at least one of a fermentation process and a distillation process to create a by-product-nutrient source mixture; and

a heater to apply heat to raise the temperature of and dry the by-product-nutrient source mixture to change the ruminant animal bypass protein of the by-product nutrient source mixture to predetermined levels.

17. The system of claim 17, wherein the heater applies heat to achieve a by-product temperature in a range of from about 180°F to about 250°F.

18. The system of claim 17, wherein the temperature is about 218°F.

19. A system to produce an improved distillers, brewers or fermenters grain by-product, comprising:

an element to establish target nutritional values for a nutritionally enhanced distillers grain by-product;

an element to determine nutrients and nutrient amounts to be added to the distillers, brewers or fermenters by-product that may have a lower RUP/UIP to achieve nutritionally enhanced distillers, brewers, or fermenters grain by-product that will meet the pre-established target nutritional values after processing.

an element to mix the determined amounts of nutrients with wet distillers, brewers or fermenters grains; and

a dryer to heat and dry the mixture of wet distillers, brewers or fermenters grains and nutrients to achieve a by-product temperature between from about 180°F to about 250°F to change the bypass protein (RUP/UIP) level, amino acid levels in the RUP/UIP and the post ruminal digestibility of the mixture to meet the pre established target nutritional values.

20. The system of claim 20, further comprising

a mixer to mix the predetermined nutrient amounts with wet distillers, brewers or fermenters grains off-line.

21. The system of claim 20, wherein the predetermined nutrient amounts are premixed prior to being mixed with the wet distillers, brewers or fermenters grains.

22. The system of claim 22, wherein the premixed nutrient amounts are added to the wet distillers, brewers or fermenters grains prior to drying.

23. The system of claim 22, wherein the predetermined nutrient amounts are added to the wet distillers, brewers or fermenters grains both before being dried and while being dried.

24. The system of claim 20, further comprising an element to cool the mixture to reach a temperature below about 200°F.

25. The system of claim 20, further including an extruder to extrude the mixture.

26. The system of claim 20, wherein heat is applied heat to the mixture while the mixture is in the extruder.

27. The system of claim 20, wherein the target nutritional values include crude protein, total amino acids, fat fiber, minerals, a ruminant animal bypass protein(RUP/UIP) range, amino acids in the RUP/UIP and post ruminal digestibility of the RUP/UIP, and the nutrients and nutrient amounts to be added that may be added are of different RUP/UIP amino acid levels, known crude protein, total amino acid, fat, fiber mineral and energy levels.

28. A feed or feed supplement made by the method of claim 1.

29. A feed or feed supplement made by the method of claim 6